

**BY ORDER OF THE COMMANDER
LITTLE ROCK AIR FORCE BASE**

LITTLE ROCK AFB INSTRUCTION 21-102

20 AUGUST 2013

Maintenance

AIRCRAFT DE-ICING PROGRAM



COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This instruction implements AFD 21-1, *Air and Space Maintenance* and applies to all 19th Airlift Wing (19 AW), 314th Airlift Wing (314 AW), Air National Guard (ANG) and Air Force Reserve (AFRES) units assigned to Little Rock AFB, AR. This instruction defines policy and procedures for snow removal and de-icing/anti-icing for wing assigned and transient aircraft. Technical Orders (T.O.) 42C-1-2 and 1C-130X-1; AFI 11-2C-130V3, Chapter 6; Federal Aviation Administration Advisory Circulars (AC) AC120-60, AC91-51A; and Air Force Flight Standards Agency's (AFFSA/XO) Holdover Tables contain procedures for cold weather, anti-icing, de-icing and adverse weather conditions. All aircraft are prohibited from taking off with coatings of snow or frost buildup on areas of the wing other than the lower surface fuel tank region. Ensure that all records created as a result of processes prescribed in this publication are maintained In Accordance With (IAW) Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of IAW with the Air Force Records Information Management System (AFRIMS) located at <https://www.my.af.mil/gcss-af61a/afirms/afirms/>. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the AF Form 847, *Recommendation for Change of Publication*; route AF Form 847s from the field through the appropriate functional managers chain of command.

SUMMARY OF CHANGES

This document has been substantially revised and must be completely reviewed. Major changes were made to training requirements, and documentation. In addition to how deicing teams will be managed.

1. Terms explained:

1.1. Holdover: The length of time de-icing/anti-icing fluids maintain their effectiveness inhibiting snow, ice, frost, and slush accumulation. The times are variable based on fluid/water mixture, meteorological conditions, temperature, and expected precipitation accumulation. This is explained in depth in the AFFSA/XO Holdover Tables that are used as a mandatory extension of T.O. 42C-1-2.

1.2. De-icing: The process of removing snow, ice, frost, or slush accumulation from aircraft surfaces, flight controls, openings, and hinge points. If there are significant amounts of snow build-up on the aircraft manually de-icing will be conducted whenever possible; de-icing fluids will only be used as an alternative method. De-icing holdover times are outlined in T.O. 42C-1-2. **Note:** (Type I de-icing fluid should be applied after manual snow removal methods are completed.)

1.3. Anti-icing: The process of inhibiting further snow, ice, frost, or slush accumulation on aircraft surfaces, flight controls, openings, and hinge points using an anti-icing fluid. Anti-icing fluids have holdover times during which their anti-icing properties are most effective, holdover times are outlined in T.O. 42C-1-2.

1.4. One-step de-icing process: The process of removing accumulation of snow, ice, frost, and slush from aircraft surfaces when no frozen precipitation is falling or anticipated. Maintenance personnel are to accomplish this process using a combination of manual methods and/or Type I heated de-icing fluids. Maintenance will complete this process on the aircraft parking spot prior to aircrew arrival.

1.5. Two-Step anti-icing process: This process is accomplished when visible precipitation is present or predicted to occur within the time the aircraft is scheduled to depart. This involves the combination of both de-icing (one-step) and anti-icing (two-step).

1.6. De-icing Operations Supervisor: The 19th/314th Aircraft Maintenance Squadron (AMXS) Maintenance Operations Officer (MOO)/Superintendent (SUPT) or designated representative will direct operations during non-routine/extreme weather events.

1.7. De-icing Team Coordinator: The 19th/314th Aircraft Maintenance Squadron (AMXS) designated representative will direct operations during normal weather conditions (call sign Victor 4). During non-routine/extreme weather conditions the De-icing Operations Coordinator is responsible to the De-icing Operations Supervisor.

1.8. De-icing Team Leader: The most experienced de-icing team member, responsible to the De-icing Team Coordinator.

1.9. De-icing Team: 19 AMXS/314 AMXS personnel will be assigned to de-icing teams and operate under the control of De-icing Team Coordinator. All de-icing team members will be fully trained/qualified prior to being assigned to this duty and squadrons must ensure that they have an adequate number of personnel trained to cover all shifts and time schedules.

The 19 AMXS/314 AMXS teams will operate autonomously in regards to their respective de-icing requirements. **Note:** (Due to the unpredictable nature of icing conditions, de-icing teams may be called out at any time.)

1.10. De-icing vehicle servicing log: This log is maintained in each vehicle during the de-icing season (see Attachment 2). Use an approved general purpose form or one approved by 19 MXG Quality Assurance. This log should contain the following information:

- 1.10.1. Date.
- 1.10.2. Aircraft tail number.
- 1.10.3. Time called to deice (Call time).
- 1.10.4. Start/stop times of de-icing/anti-icing operation.
- 1.10.5. Amount of fluid discharged.
- 1.10.6. Freezing point (FP) of the fluid.
- 1.10.7. Weather/Aircraft surface Condition.

2. De-icing/anti-icing fluids approved for C-130 use are:

2.1. MIL-A-8243 Type I and Type II (approved until stocks are depleted).

2.2. AMS 1424 Type I (both glycol based and glycol free fluids are approved): this is an improved commercially supplied de-icing fluid that replaces the military specific de-icing fluid MIL-A-8243 that has been discontinued. The fluid is normally mixed with water and applied “heated” to remove snow, ice or frost accumulations from aircraft surfaces. This fluid provides longer “holdover” times than the military specific fluid. AMS 1424 is a de-icing fluid with *limited* anti-icing properties. Type I fluid is orange-red in color and can be easily mistaken for hydraulic fluid.

2.3. AMS 1428 Type II and Type IV: Type IV authorization must be obtained from the C-130SPO prior to each use speeds that generally exceed approximately 100 to 110 knots and have a take-off ground roll time of not less than 23 – seconds.

3. Responsibilities:

3.1. MOC will:

3.1.1. Monitor de-icing operations and track the aircraft that have completed de-icing.

3.2. De-icing Operations Supervisor will:

3.2.1. Direct de-icing operations during Non-Routine De-Icing Operations.

3.2.2. Determine priorities with 19 OG and 19 OSS based on weather severity and available resources.

3.2.3. Ensure the effective management of trained/qualified personnel and resources during Non- Routine De-Icing Operations.

3.3. De-icing Operations Coordinator/Team Leaders will:

3.3.1. Conduct annual de-icing/anti-icing training. Instructors will be designated by the unit commander and a letter filed at the 19 MOS/MTF. Certified individuals as De-icing

Operations Instructors will demonstrate in-depth knowledge of training material content. Training will include: environmental impact, hands-on deicer vehicle and boom operation, servicing, manual snow removal and application of de-icing/anti-icing fluids, forms documentation and aircrew communications, as required. Dash 21 will maintain current procedures for purging de-icing vehicles for training purposes.

3.3.2. Notify MOC with de-icing vehicle capabilities and adequate personnel. Review the flying schedule to ensure requirements will not exceed maintenance capabilities (dependent upon forecasted or current weather conditions) during routine flying operations between 0300-1100.

3.3.3. Ensure assigned deicers are operational and serviced with the applicable de-icing/anti-icing fluid. Ensure the servicing log is annotated with the proper information each time the truck is filled or utilized to deice an aircraft.

3.3.4. When the number of serviceable deicers falls below the minimum essential level (MEL) after normal duty hours, during weekends/holidays and when the flying schedule dictates contact the 19 LRS/LGRV stand-by technicians through vehicle operations dispatch element.

3.3.5. After a de-icing team completes the aircraft de-icing/anti-icing operation a team member will inform the flight crew of the type and concentration of de-icing fluid used, the time application was started and finished, and the fact the aircraft has been inspected. This information will be recorded in the AFTO Form 781A or verbally communicated to aircraft commander or representative.

3.3.6. Furnish daily glycol usage slides to 19 CES/CEV and MOC.

3.4. 19th Maintenance Operations Squadron/Maintenance Training Flight will:

3.4.1. Review course documents to ensure compliance with AMC Instructional System Review (ISR) process.

3.5. 19 AMXS/314 AMXS and Transient Alert (TA) Contractor will:

3.5.1. 19 AMXS will ensure a minimum of serviceable deicers are available for 19 AMXS sign-out/usage.

3.5.2. 19 AMXS/314 AMXS de-icing teams will assemble and stage out of respective AMUs.

3.5.3. Designate by appointment, de-icing team leader(s) to assist the De-icing Operations Coordinator with initial/refresher deicer training, deicer servicing and maintenance, and overall de-icing operations during the de-icing season from 15 October to 15 March, to include special events and presentations.

3.5.4. Conduct annual de-icing/anti-icing refresher training. Training will include: environmental impacts, hands-on deicer vehicle and boom operation, servicing, manual removal of snow and application of de-icing/anti-icing fluids, forms documentation and aircrew communications as required.

3.5.5. Document AF Form 55 or equivalent identifying hazards involved for individuals who have received deicer operations training, this may be included in a Job Safety Plan.

3.5.6. Snow removal augmentees will come from either 19 AMXS/314 AMXS or 19th Equipment Maintenance Squadron (EMS). If augmentees come from outside the unit, the production superintendent, or maintenance supervision will coordinate augmentee requirements with the De-icing Operations Coordinator.

3.6. 19 EMS will:

3.6.1. Provide personnel to augment the 19 AMXS snow removal teams when requested.

3.6.2. Snow removal augmentees are used to assist de-icing teams in manual snow removal from the aircraft. Only when properly trained, designated augmentees may use de-icing fluid to remove snow.

3.7. 189th Airlift Wing will:

3.7.1. Ensure all required de-icing information is distributed to 19 CES/CEV as appropriate.

3.7.2. Use Best Management Practices to reduce the amount of glycol introduced to the environment as outlined in the Little Rock AFB Storm Water Pollution Prevention Plan (SWPPP).

3.8. 314 OG will:

3.8.1. Provide aircraft deicing priorities on the daily flying schedule. 48 AS and 62 AS DO, Ops Sup, or central scheduler will provide de-icing priorities to appropriate 314 AMXS section.

4. Routine De-icing Procedures: (applicable 19 AW/314 AW)

4.1. De-icing Operations Coordinator(s) and De-icing Teams will be assembled prior to the days flying schedule but no later than 0300 hours.

4.2. De-icing vehicles will be inspected and preheated then placed on standby per the AMU and notify MOC, as needed.

4.3. If applicable, remove snow/accumulation from the aircraft surfaces prior to it being deiced.

4.4. Individual(s) from the owning organization will clear the area of all equipment and will assist the De-icing Teams with de-icing operations.

4.5. De-icing Teams will brief all personnel assisting with operations on current de-icing operations as required.

4.6. Expediter will contact the MOC with de-icing fluid application start and stop time.

4.7. De-icing Teams will document all appropriate information on the De-icing Vehicle Servicing Log.

4.8. De-icing Teams will ensure de-icing information is communicated to the aircrew.

4.9. De-icing Teams will return to staging area and await further instruction from the Expediter.

4.10. De-icing Teams will remain on standby until de-icing operations are terminated or until they are released by the AMU.

4.11. De-icing Teams will inspect, service, and report discrepancies to vehicle maintenance in preparation for the next day's de-icing operations.

5. Non-Routine De-icing Operations (as weather dictates)

5.1. The 19/314 AMXS MOO/SUPT, 19 OG (or designated operations and maintenance representatives) will determine operational limitations based on flying schedules and resources available. During non-routine operations they will assume the role of de-icing operations supervisor.

5.2. Production Superintendents are responsible for ensuring the following:

5.2.1. De-icing operations are accomplished IAW established procedures.

5.2.2. Place heaters in the front and rear of the aircraft five hours prior to crew show.

5.2.3. Inform the MOC when de-icing/anti-icing operations begin and end on each aircraft.

5.2.4. Contact the MOC when de-icing is complete for the current days flying schedule.

5.3. Document all fluid use and submit the information to the De-icing Operations Coordinator for inclusion in the glycol usage slide.

6. Runway/Hammerhead de-icing and anti-icing procedures.

6.1. Final end-of-runway de-icing/anti-icing will not be accomplished on the Hammerhead (runway 25 and 07). Aircraft will taxi to an approved spot in coordination with the MOC and the De-icing Operations Coordinator to have the aircraft deiced

6.2. Aircraft are not permitted to take off with coatings of snow or frost buildup on areas of the wing other than the lower surface fuel tank region. The aircraft commander is the final authority for decisions regarding adequacy of de-icing/anti-icing prior to flight. Maintenance personnel will first remove large accumulations of snow from aircraft surfaces by some other method besides the use of de-icing fluid. Maintenance will ensure that all flight control surfaces, hinges, and sealed compartments are free of slush, snow, and ice. Aircrews will also check flight control surfaces for freedom of movement after de-icing is completed.

BRIAN S. ROBINSON, Col, USAF
Commander

Attachment 1**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

AFI 10-229, *Responding To Severe Weather Events*, 15 October 2003

AFI 21-101, *Aircraft and Equipment Maintenance Management*, 26 July 2010

AFOSH STD 91-203, *Air Force Consolidated Occupational Safety Instruction 15 June 2012*

TO 35E17-6-21, *Operation and Maintenance Instructions with Illustrated Parts List – Deicer/Washer, Truck Mounted, TM-1800, SN 1730-01-208—0930, P/N 519-1550 (Landoll Corp, 1 June 1992*

TO 42C-1-2, *Anti-Icing, De-Icing and Defrosting of Parked Aircraft*, 11 May 2007

Prescribed Forms

None

Adopted Forms

None

Abbreviations and Acronyms

19 AW—19th Airlift Wing

314 AW—314 Airlift Wing

AGE—Aerospace Ground Equipment

MOC - Maintenance Operation Center

NPA - Non-Powered AGE

SOE—Sequence of Events

TA—Transient Alert

Attachment 2

***COLD WEATHER OPERATIONS SEQUENCE OF EVENTS (SOE) FOR C-130
AIRCRAFT*****C-130 WINTER SOE (15 Oct- 15 Mar)**

<u>RECOMMENDED ACTION TIMES</u>	<u>" WINTER OPS"</u>
SINGLE/FORMATION	<u>15 OCT-15 MAR</u> <u>(20 MINUTE TAKEOFF REQUIRMENT)</u> <u>SEQUENCE OF EVENTS</u>
4	Crew Alert
3	Aircrew show at squadron: Crew brief
2+45	Initial de-icing (if required) complete Engineer/Loadmaster Aircraft Showtime for Preflight
1+35	Fleet Service Delivers Meals (APS) Lavatory Services Complete (APS)
1+25	Passengers Arrive (PAX Terminal)
1+20	Preflight Complete (Doors Closed)
1+00	De-icing/Anti-icing begins (if required) APU is shutdown.
0+30	De-icing/Anti-icing ends
0+20	APU start, Engine start.
0+15	Block out
0+05	External Visual Inspection Completed by Crewmember
0+00	Takeoff

Attachment 3

GLYCOL TRACKING SHEET

GLYCOL											
Notes	Tail No.	Acft Spot	Unit Acft Assigned	De-Ice Operator	Call Time	Start Time	End Time	Fluid Type(I, II, III)	Amount Used	Fluid Freeze Point/ Glycol %	Surface Condition (Frost, Snow, Ice)
AF IMT 3130, 19830501,V2 PREVIOUS EDITION WILL BE USED GENERAL PURPOSE											